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ADDRESS

ON

Native Grapes of the United States.

READ BEFORE THE AMERICAN HORTICULTURAL SOCIETY, AT NEW ORLEANS, JAN. 20, 1885, AND PUBLISHED IN FULL IN THE TRANSACTIONS OF THE SOCIETY FOR 1885.

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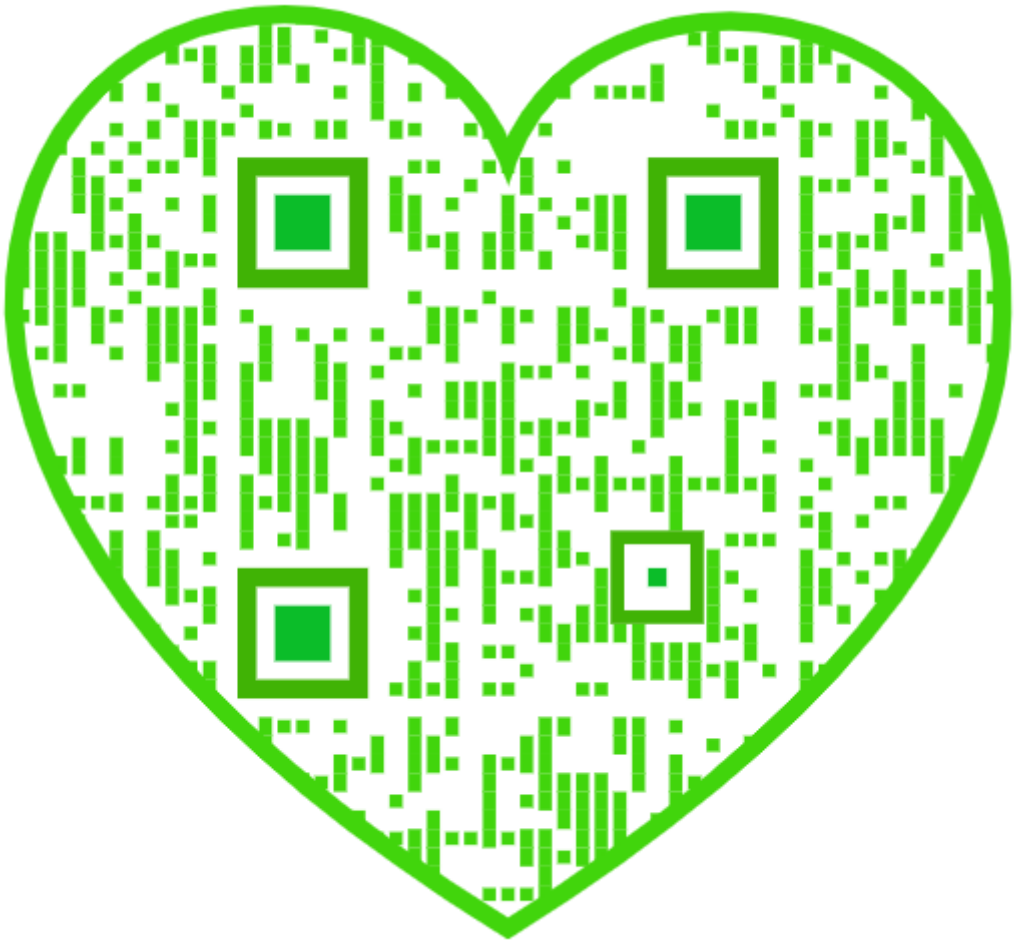

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The Transactions of the American Horticultural Society, for 1885, will contain, among other valuable papers, the following exhaustive treatise on the

NATIVE GRAPES OF THE UNITED STATES,

by that able and thoroughly practical scientist, T. V. Munson, of Texas.

This report, which will be the transactions of the very interesting meeting held in New Orleans, January, 1885, can be had on application to

THE SECRETARY.

NATIVE GRAPES OF THE UNITED STATES.

BY T. V. MUNSON, M. SC.

[Read before the American Horticultural Society, New Orleans, January 20, 1885.]

All botanists, who have attempted the classification of the grape genus, have complained of its difficulties, and confusions of one form with another. Many have concluded that its so-called species are only artificial terms to indicate certain forms of considerable extent, but that in reality there is no clear separatrix. This is certainly true in one sense—the order of development in time—as has been proven true of all organic beings, by such vast researches among plants and animals as those of Wallace, Darwin, Hæckel, Walsh and others. According to this, if every individual plant and animal now existing and that has ever existed, were placed side by side according to their affinities and genealogies, the organic kingdom would be one monstrous tree joined in all its parts by the universal cellular protoplasmic link; and this tree would be rooted deep upon another infinite inorganic mass of nicely graded and connected crystalline and chemical atoms, each and every link in the universe of matter, varying but a minute degree from its neighbor, yet two taken at a distance from each other show proportionate differences. If the intermediate individuals were left out of view, those in comparison would be considered of different varieties, species, genera, orders, etc., according to the distances apart the units of comparison were taken. If all still lived and the chain of development seen complete, the fact would not make an ass and a horse, a dog and a wolf, a Caucasian and an African, a Scuppernong and a frost grape any the less different from one another.

The vicissitudes of time have cut and broken away innumerable branches from the great tree of life. They have fallen, through chemical change, back into the mineral base, to be again revitalized, not as the same old individuals, but as parts of those still living and multiplying. Repeated upheavals and subsidence of the earth's crust, through millions of years, as we unmistakably learn in geology, have been the most potent species-makers, in a technical sense; and thus the connecting links, especially where large gaps occur between the living branches, are now out of existence and the separation of the living parts as complete and permanent as though they had never been joined, so far as again intermingling is concerned.

But long separation of once joined links, under widely different environ-

ments, has always been the true cause of specific variation. This is done by transplanting to a different soil or climate, or both, and by mixing of blood of two well separated branches (species), giving a more sudden start, to change, than a mere variety, which, if at the same time the new product be put under new environments, as a hybrid grape-seed carried by a bird into an entirely different soil and climate from that occupied by the parents, in time quite a novel and unaccountable species would develop and only a thorough comparative anatomist could trace its origin.

Some naturalists make the loss of power to intermingle, the separatrix of species. Prof. Planchon, a noted French ampelographer, takes this position. The lamented Dr. George Engelmann, who did so much for useful botany, and in this sphere to simplify the perplexing grape genus, held to this view in the main, and declared it as a law, that, "honest nature a'hors hybridization;" as much as to say there is a dishonest nature, or else there are no hybrids.

If this is the proper divider of species, then there is but one species of true grapes, and Dr. Englemann's thirteen native species stand condemned by his own rule, as hybrids are known among all of them. Even the peculiarly distinct and uniform Scuppernong, in the hands of Dr. Peter Wylie, yielded some remarkable hybrids.

On the other hand, Prof. Millardet, another eminent writer on the grape, finds as many true species as Dr. Engelmann, and hybrids among them often. My own experience so abundantly confirms this view, that I am in utter confusion without accepting it. Doubtless the whole disagreement arises from the definition of species, by which the classification is made. A more proper definition of species probably is a type embodying peculiar and uniform general characteristics (however admitting varietal changes), which continually occur by natural distribution over a large area, or in a great number of individuals, and which have great antiquity, and may be supposed to relate purely to a common parent in the remote past. Then those intermediate individuals, occurring here and there in the vicinity of two species in juxtaposition, which nearly always possess only the two sets of specific characteristics juxtaposed in the two species, but completely blended in the lone individual, such as we find in the mule and mulatto, we are justified in terming hybrids.

One holding the theory that "nature abhors hybridization," is always perplexed at finding such individuals wild, and must invent still another theory, that it is "a sport of nature," in other words, an effect without a cause; or else be continually creating new species, as did Rafinesque, in either case producing endless confusion.

In a long course of reproduction, hybrids, like varieties, may become species. This seems true of several of our recognized species of grapes—the Palmata in particular, and Monticola. The "Southern Æstivalis" of vineyardists is entirely too young and variable to rank as a species, yet if placed in a region apart from others for a long period it would become a species of this character. More of this further on.

The most natural method of classification would be to follow the development in time, if possible. This would lead to the necessity of being a good paleontologist and geologist, as well as an expert botanist. In its full amplification it would add another most useful study to the university course, viz.: the origin, development, perpetuation, hybridization and decay of species; or, to coin a word for brevity's sake, *Speciology.*

Looking at the classification of grapes in this light, Dr. Engelmann's order (the ablest and most accurate yet published, but which seems to have been made entirely according to botanical analysis of specimens in the laboratory, and without considering geographical distribution and development in locality and time,) appears to me quite unnatural.

Claiming and possessing no authority, only of fact, as acquired by careful search and observation, to vary from so profound a student of nature as was Dr. Engelmann, and knowing well how I expose myself to scathing criticism and the charge of pedantry in suggesting a different order, I do so because I believe it to be the most natural and useful to the viticulturist. Further investigation may modify it. The tendency is simplification.

Rafinesque's forty-one American species of fifty-five years ago, by Engelmann were reduced to thirteen, well defined and in the following order: 1. Labrusca; 2. Candicans; 3. Caribbea; 4. Californica; 5. Monticola; 6. Arizonica; 7. Æstivalis; 8. Cinerea; 9. Cordifolia; 10. Palmata; 11. Riparia; 12. Rupestris; 13. Vinifera (placed here by Engelmann to show his notion of its relationship); 14. Rotundifolia, or Vulpina.

My reasons for dissenting from this order and suggesting another, are: 1st. The natural line of introduction and development (suggested by the distribution conjointly with the structural analysis of the species, and which pretty nearly agrees with the more recent geological changes in North America) upon this continent is violated in several places. 2d. This leads to one of the most vital of all subjects to the practical horticulturist, viz.: adaptability to special localities and soils.

To amplify my first reason: The geology of North America indicates clearly that Canada was first permanently above the great universal ocean. Next a backbone shot up along the Apalachian region, gradually growing less, and curving in Eastern Kentucky and Tennessee to the westward, passing in a low range into the Ozarks of Southern Illinois and Missouri, Northern Arkansas; thence southwestwardly through the Indian Territory, Western Texas, and joining in more recent geological time the Rocky Mountain uplift; thus forming the great Mississippi basin-rim on the east, south and west. Within this rim, occupying the entire basin, there once was an inland sea, higher than the outer seas, which, finally cutting out on the east, formed the St. Lawrence river, and on the south made the "Father of Waters," passing through the rim not far above Cairo, Illinois. By the rains of time this inland sea became fresh water lakes, of which we have yet a few remnants in Minnesota, Wisconsin, Michigan and Canada.

On the rim of this basin the first lodgement of grapes was made, probably

far up in Canada, and came in from the Atlantic on the east, up the then broad, long gulf now contracted into the St. Lawrence, and having no mountains to climb, spread from there westward and southward, stocking the entire basin with the Riparia blood, which since has run into various tribes; Riparia, the main stem, all northward from the Ozarks; in these, the Rupestris, and westward Nuevo Mexicana and Arizonica. Later, the southern rim caught new importations from the warmer southern seas, in the direction of the Caribbees, landing the Cordifolia, Æstivalis and Cinerea, from Virginia to Texas, which, in time, spread into New York, Ohio, Illinois and Northern Missouri, and southward, more recently, to the Gulf.

As time went on, and the constantly diminishing Gulf continued to add the hundreds of miles of illimitable natural wealth—now the Southern States—to the south side of the Ozark rim, she forgot not to waft still other grapes (which had already specifically developed), to these shores from the center of origin, the Caribbee Islands, or, much more probably, from a continent eastward of the Caribbees in the Atlantic Ocean, dropping the Muscadine or Scuppernong of the South, all along the coast from Mexico to Maryland, the Labrusca on the eastern coast from Maine to Georgia, the Mustang (Candicans) on the coast of Mexico and Texas, then far inland, and Caribbea, quite recently in Florida.

Geology, palæontology, archæology, the natural distribution of plants and animals, and the results of recent deep-sea dredgings, all clearly point to such a continent in the misty past, and this reminds us of the legendary "Atlantis" of Plato, as still existing there some twelve thousand years ago, and which in one awful day and night of earthquake convulsion, sank deep beneath old Ocean. (See Donnelly's "Atlantis," Harper Bros., 1882.) Be that as it may, the species of grapes in the United States came in succession, first in the North, showing their time of residence by the extent of their spread, while the later came in the South and around the coast, having less distribution.

Now you can comprehend why I propose a different order among the species from that of Dr. Engelmann, and can easily see the importance of my second reason, *adaptability;* hence I offer the following:

Classification of the Native Grapes of the United States, According to their Natural Affinities and Distribution (including Vinifera for comparison).

1. Riparian Group.

Earliest to leave out, bloom and ripen. Have very thin diaphragms in the joints. Grow with ease from cuttings. Roots wiry, penetrating and perfectly resistant. Plant endures all manner of hardships well. Cluster and berry small to medium. Fruit in quality good to excellent, possessing rare wine properties.

(*a*) *Riparia* (Riverside Grape).

Extends from Labrador to Texas, from Virginia to Montana. Leaves with coarse, long, sharp teeth, smooth or slightly pubescent; wood gray,

smooth; often pubescent on Mississippi River; tendrils rather weak; diaphragm thinnest of any species, being not much thicker than writing paper; accidentally hybridized with Labrusca in Kentucky gave the Taylor. No vines of pure blood are yet cultivated for profit.

(*b*) *Rupestris* (Sand-beach, or Sugar Grape).
From East Tennessee westward, in the hilly regions, to Southwest Texas, fast disappearing by the browsing of stock. Leaves reniform, smooth, coarsely toothed; wood dark gray, smooth, slender, much branched and spreading gooseberry-bush fashion naturally, but if trained makes a good vine, but requires much pruning; tendrils very small and weak, soon disappearing after first year. Mr. H. Jaeger is the only one who has introduced any varieties into cultivation. His Nos. 59, 60, 62, 64, etc., found wild, make a fine claret, and offer a fine start to hybridize upon, which he has successfully done already with promising results. Huntingdon is an accidental hybrid, containing a large portion of Rupestris blood and some Riparia. The earliest of all species to ripen; fruit usually larger than Riparia but cluster smaller; fruit perfectly resistant to rot, and may give a valuable strain of varieties, free from this more threatening trouble than phylloxera, to the Vinifera and most Labrusca and many Æstivalis.

(*c*) *Nuevo Mexicana* (Prof. Lemmon) (Woolly Riparia)
Northwestern Texas ("The Panhandle") and New Mexico, in sandy ravines and canyons. Leaves cordate or nearly round, with coarse, sharp, or blunt teeth, more or less woolly, especially when young, leathery and enduring; wood light gray, and quite woolly when young; erect, shrub-like, with wiry, deeply penetrating roots in the fashion of a tree with taproot; grows naturally in thickets, like bushes without support, having small tendrils, but when brought into lower timber lands makes strong climbing vines; fruit and seed larger than the Northern Riparia; quality most excellent, very sugary; offers most excellent stock for the experimenter. The writer has varieties with fruit one-third of an inch in diameter. This form gradually runs into the next, which has a great similarity in habit of growth, with larger fruit-clusters. It is termed

(*d*) *Arizonica* (Arizona Grape).
Leaves round cordate, coarsely and regularly acute toothed, smooth or pubescent, seeds much like the woolly form, wood gray, or reddish gray, smooth, or pubescent when young. Fruit excellent.

2. Cordifolian Group.
Late to leave out, bloom and ripen; wood and leaves smooth, diaphragm thick; fruit in long, many-berried clusters, very small, mostly seed and skin; roots wiry and resistant; found mostly in bottoms.

(*a*) *Cordifolia* (Frost Grape; Sour, or Pungent Winter Grape).
Extends from New York west to Nebraska and Kansas, and covers the regions southward from these States to the Gulf, chiefly in rich bottoms and along streams. Leaves heart-shaped, with coarse, blunt or sharp teeth, smooth on both sides, leathery, veins below of a yellowish green; young wood smooth, dark gray or mottled dark and light gray, tendrils long and very strong, climbs high and grows to great size, sometimes a foot or more in diameter: diaphragm very thick; cuttings grow with great difficulty; fruit small, shining, seedy, very sour and pungent till ripened with frost, then sugary. A most remarkable hybrid of this with Labrusca was found wild in Virginia by a Mr. Ronk, some thirty years ago, having fruit and cluster about the size of Ives's Seedling, of a pure rich vinous quality, pulpless, with a jelly-like, melting meat. Vine very productive, vigorous. It was moved into the man's yard, and has borne well for twenty-eight years, and is yet in fine health and growth. Has never been disseminated. Was accidentally brought to my notice while searching for specimens of native grapes. Have carefully examined the leaf, vine, and ripe fruit, which show it to be such a hybrid. Have also found some quite good varieties of this species hybridized with the large Æstivalis in Texas. These hybrids show the ameliorating effect of hybridization. Scarcely could any two species of less promise for intermingling than Cordifolia and Labrusca, be named, yet Ronk's Blue of Virginia is certainly fine, with neither pungency nor foxiness.

(*b*) *Palmata*, or *Rubra*.
Along the banks of the Mississippi river, above St. Louis, Mo. Seemingly a multiplied hybrid of Cordifolia with Riparia, with possibly a trace of Cissus blood, indicated in the fruit, seed and leaf. Leaves sharp-toothed with long taper-points, not always palmate, young wood always red, hence Rubra, a better name than Palmata; grows fairly well from cuttings; diaphragm medium; leaves and wood smooth, branches slender. Rarest and most local of all our species.

3. Cinerean Group.
Leaves out, blooms and ripens after Cordifolia, young wood angled and covered with an ash-colored cobwebby pubescence; cuttings root with much difficulty.

(*a*) *Cinerea* (Ashy or Sweet Winter Grape).
Covers nearly same region, and found in similar localities with Cordifolia, but more inclined to warm wooded bottoms, and does not extend so far north, west of the Alleghanies, but is reported to me by Mr. A. J. Caywood, in S. E. New York, above where Cordifolia has been reported; more sensitive to severe changes than Cordifolia, when taken into open culture. Having the same habits, distribution, size and shape of cluster and fruit, and blooming and ripening late (later

than Cordifolia), and often hybridized with it. I have placed Cinerea next Cordifolia, though otherwise it is a very distinct species. It extends from Western Texas to the Atlantic, from Illinois and New York to the Gulf, even to Southern Florida, and in its pure form is quite constant; leaves, from Manatee county, Fla., S. E. Arkansas, and Red River, Texas, showing great similarity in having a long, taper point, small, blunt teeth, under surface densely pubescent, of an ashy brown color, and upper surface with scattering, cobwebby hairs drawn along the surface. Young wood distinctly angled (more in western, less in eastern samples), and, like the leaves, has the ashy pubescence; young wood under the pubescence brownish gray; tendrils long and strong, clusters usually exceed Cordifolia in being longer and much more branched; fruit very sprightly, pure, rich, must on Æchsle's scale, from 100° to 120°, vinous, no trace of pungency or disagreeable property; diaphragm thick to very thick; roots wiry, penetrating and resistant; endures great heat and drought, but sensitive to cold.

(*b*) *Monticola* (Mountain Grape).

Hills of Central Western Texas apparently an old, much multiplied hybrid of Cinerea with some round, smooth-leaved Riparia variety; leaves round, smooth, or with scattering, short pubescence; under surface of a shining appearance, small, leathery, well suited to enduring heat and drought, leaves out, blooms and ripens very late, about with Cinerea, and the cluster much resembles it, though smaller, and the berries larger. Varieties have been reported with white fruit and of fair size and excellent quality. Young wood angled and pubescent, but not so much so as Cinerea. Tendrils medium.

4. Æstivalian Group (Summer Grapes).

Leaves out, blooms and ripens before Cordifolia, here in North Texas, but in S. W. Missouri Mr. Jaeger reports it later in blooming, and after Labrusca. With further investigation I find that the Cordifolia species blooms before Æstivalis here in Texas, as well as elsewhere, from three to five days, also, that Warren, Herbemont, Le Noir and others of that strain, show faint traces of Vinifera, though chiefly Æstivalis and Cinera. Diaphragms thick, young wood dark, reddish brown, often with weak prickles, and prunose bloom, especially near the joints on vigorous growth, which are easily rubbed away; roots hard, penetrating, resistant; cuttings root poorly; tendrils medium to very strong.

(*a*) *Northern Form.*

New York, Ohio, Indiana, Illinois to Missouri river, southward to Maryland and Tennessee. Leaves thin, with a thin, light colored pubescence along veins on under side, seldom lobed more than Labrusca, fruit usually small and astringent, especially east, but larger and finer going westward. A fine variety found by A. J. Caywood, in New York, hybridized with Catawba (Labrusca) by him, gave that re-

markable new grape, Ulster Prolific, much larger and finer than Delaware. This form insensibly runs into the

(*b*) *South-eastern*, or *Norton's Va. Forms.*

Found southward from the Northern form, and east of the Mississippi river. Leaves more leathery, with dense brown pubescence along the veins, and occasionally spreading therefrom upon the under surface of the leaf, especially in Florida samples, where also the young twigs are covered with this rufous pubescence; fruit usually quite small, not much larger than Cordifolia, and very astringent, in medium to long and slender clusters, but occasionally quite fine in size and quality. This variableness, doubtless, has come by the intermingling, from time to time, with other species, especially with Labrusca, and occasionally with Cordifolia and Cinerea. When with the latter, as in Warren, Herbemont, Le Noir, Louisiana, etc., the result is marvelous.

(*c*) *Southwestern Form*, *Post Oak*, or *Lincecumii*, in Texas; *Æstivalis Jaeger*, in Missouri.

From Missouri river through Western Missouri, Arkansas, Indian Territory, Northern and Eastern Texas, and Northeastern Louisiana. Leaves largest of any species, often beautifully, three, five and rarely seven-lobed, having a peculiarly bluish appearance beneath, with veins bearing a light brown pubescence. The fine prickles and prunose bloom on young wood quite characteristic, more so than the forms (*a*) and (*b*). Fruit small to very large, in color black and shining, but generally with heavy bloom, through shades of purple and red to nearly white; quality from austere, acid and disagreeably astringent pulpy and musky, up to pure, delicate, vinous, sweet, with sometimes delightful nutty and vanilla-like flavors, offering a fascinating field for the experimenter. Mr. Hermann Jaeger has done good service in his region by finding such treasures as Racine, Neosho, 4, 13, 17, 32, 42, 43, 52, 55, and numerous others, and by producing hybrids already with Rupestris, in 70 and 72, and Cinerea in his 50 and 56. Here in Texas "Lucky" (probably the earliest Æstivalis known), "Purple," "One Seed," "Late Prize," and a number of others have blessed my own searchings in the woods.

Often this form shows traces of Candicans and Labrusca in the fruit and seeds, and some other points. In Texas, where the Candicans is so abundant, it is easy to see how this blood got into Æstvalis; in Southwestern Missouri it is not so easy to account for, and the Labrusca blood, which seems still more frequently met with, is inexplicable, unless it was brought among them from the East by pre-historic man, or already intermingled, when drifted upon these shores by the ocean currents, from the original home of the grape genus, where these forms or their progenitors grew near each other. It is

only conjecture now, but botanical analysis, nevertheless, reveals these characteristics in many of our western Æstivalis.

5. Vulpina Group (Foxy-leaved Grapes)

Dense pubescence or wool on under side of leaf, in the Labrusca and Caribbea, often of a foxy color, and this is probably why, originally, Linnæus applied Vulpina to the species, and by some mistake it was later unaccountably and improperly applied to Rotundifolia or the Scuppernong. To call the musky flavor of Labrusca "foxy" is a misnomer, as no fox smells or tastes like that; but the under side of many Labrusca and Caribbea leaves have a true foxy appearance, while no other species has. Fruit usually large, with tough, thick, pungent skin, especially so in Candicans, pulpy, and in Labrusca having a most characteristic musky smell and taste. Leaves out, blooms and ripens after Riparia and before Æstivalis. No one of this group extends naturally into the inland basin.

(*a*) *Labrusca* (Fox Grape).

Atlantic slope, from Maine to Georgia. Concord, of Massachusetts, Catawba, Isabella, etc., of Carolina, are fair types. Loves warm, wooded, well drained, sandy lands, much of the habit of the Æstivalis; roots spreading, of medium firmness, only fairly resistant; wood firm, smooth or woolly pubescent when young, of a brownish red when mature; diaphragm medium to thick; cuttings grow readily; leaves large, entire or three-lobed, woolly pubescent beneath, often of a foxy-red color, leathery; tendrils medium to strong, *continuous* in well grown wood, though in Catawba and some others often *intermittent* like other species, indicating intermixture; fruit large to very large, in medium to large clusters; seeds large, notched at top, with sunken raphe, and chalaza. The chief species upon which experimenters in the United States have worked, producing innumerable varieties and hybrids, the latter almost entirely with Vinifera, and generally partaking with them in their tendencies to rot, mildew, and sensitiveness to extremes and philloxera.

(*b*) *Caribbea* (*Caloosa*, by some, in Florida).

Middle and South Florida, and almost identical with same named species in Cuba, Hayti, Porto Rico and Jamaica. In Florida quite variable, from much like Labrusca to close resemblance to Candicans; roots wiry; wood more or less woolly, brownish red; diaphragm medium; cuttings root poorly; leaves intermediate in shape between Labrusca and Candicans, deltoid, smaller than either; pubescent, similar to Labrusca, but rather more woolly; tendrils medium; fruit small to medium, generally austere, pulpy. The species often occurs mixed with Æstivalis, which is abundant in same region. Though evidently of later introduction than Labrusca or Candicans, I place it here, as its botanical analysis clearly requires.

(*c*) *Candicans*, or *Mustangensis* (Mustang).
Southeastern Indian Territory, in a belt from one hundred to two hundred miles wide, extending southwestwardly into Mexico. Found chiefly in strong, well drained limestone bottom and bluff lands, climbing by medium tendrils profusely to the tops of tallest trees. Have found vines with as many as four *continuous* tendrils. Roots deep and wiry: wood rather soft, but hard to root from cuttings; diaphragm medium; bark on old wood very finely divided and checked by thread-like fibers, persistent, becoming very thick; young wood heavily coated with a cobwebby white wool, beneath which the cuticle is of a light gray; leaves usually deltoid on old vines, being nearly truncate at base, and obtuse pointed with few small mucronate teeth, convex on upper surface, while all other species are concave, or at most flat, as in Caribbea, densely woolly below, like the young wood, and thin, cobwebby hair on upper surface when young, becoming smooth and leathery with age. On young vines leaves often deeply, almost palmately-lobed, as are the Æstivalis, and this fact points to a former near kinship of the two species. Fruit large to very large, in small clusters; very prolific; blooms but a few days later than Riparia, and numerous hybrids therewith occur, as also in Western Texas with Rupestris, "Vitis Champini" being one such. Seeds intermediate in markings between Woolly Riparia and Æstivalis, and also bear some resemblance to those of Rotundifolia, in sometimes having small wrinkles radiating from around the chalaza. The fruit, cluster and habit of vine also bear some resemblance to Rotundifolia, but otherwise it is exceedingly different; skin thick and possessed of fiery pungency, but the pulpy inside sweet and juicy, with generally a pleasant taste, but none of the Labrusca flavor whatever; makes a durable, rich wine of excellent taste.

6. Meaty-fruited, Soft-rooted Group.
Chiefly found around the Mediterranean Sea and eastward in Asia, running through Persia, India, Burmah, Siam, China and to Japan, originally in several species. The only native in the United States of this type seems to have come from across the Pacific and spread up and down in California.

(*a*) *Californica.*
In habits, roots, wood, leaves, tendrils, fruit, seeds, cluster, time of blooming, ripening (which is about with Æstivalis), and the readiness with which it intermingles with Vinifera growing near it, it is certainly more nearly related to Vinifera than any other American species. Though more resistant than Vinifera, yet it is less than any other native. In leaf it reminds one of the Grenache and Burgundy grapes.

(*b*) *Vinifera* (Old World Grapes).
Seems an artificial combination of several original species from Europe

and Asia and Africa, by long hybridization and cultivation. Placed here only for comparison and to indicate its relationship. This appears to occupy about the same position in distribution in the Old World as do the Riparian tribes in the New, and seem to have drifted eastward from the center of origin, as did the Riparia westward and northward.

7. ROTUNDIFOLIA (*Vulpina*, improperly Scuppernong or Muscadine). From Grayson county, Texas, eastward in bottom wooded lands to Southern Maryland, and southward in all the Southern States to the Gulf; roots very hard and penetrating; wood hard, slender; grows with greatest difficulty from cuttings; warty, with most obscure grooves in young bark of any species; no proper pith, and, consequently, no diaphragm; leaves round or heart-shaped, with coarse, regular, acute teeth, smooth and shining on both sides, firm and tough; tendrils never forked, as is the case in all others; medium; fruit very large with a rough, tough skin, always of an agreeable taste, making good wine; seeds very large, somewhat resembling small coffee grains, small wrinkles radiating from the chalaza toward the margins, but not around them; clusters very small, having from three to eight berries, which drop easily as soon as ripe; seems to have no diseases and never fails to make a crop in its native home; leaves out and blooms the latest of all, but ripens from August to October. By distribution it would come before Californica and Caribbea in the United States, but by affinity and development it is most distinct from all other species and has never been found hybridized in the wild state with any other.

With this outline and classification before us we can the more readily and intelligently enter into some viticultural observations, which I trust may lead to more extensive and accurate experiments in the endeavors to develop the valuable qualities so numerous and superior in several of our native grapes.

To further illustrate natural distribution, whose laws we must observe to be successful, I shall only cite the single State of Texas, which stands foremost of all in the number and value of species, illustrating most admirably the rules of adaptation. In her northwestern "Panhandle" are Riparia, proper, though not abundant, and Woolly Riparia (Nuevo Mexicana); in her central belt of intermingled prairie and timber, hills and plains, silicious and calcareous soils, of the cretacious formations, are scatteringly, Smooth Riparia, Woolly Riparia, Rupestris, Monticola, Cinerea, Candicans, Cordifolia and Æstivalis; extending on to the moist, sandy, timbered regions, along streams and timber belts, in her black prairie region, are Candicans abundantly in wooded lime soils, Cordifolia and Cinerea in bottoms, Æstivalis in sandy post-oak lands; in the eastern sandy, densely timbered regions, continue scatteringly Cordifolia abundantly, Æstivalis, Cinerea and often Rotundifolia, the latter becoming very aboundant lower down, while Cordifolia and Æstivalis are seldom found, and Cinerea is still common to the everglades bordering the Gulf.

This teaches the northern vineyardist that he need not try the Scuppernong, the Mustang, the Caribbea, nor the Cinerea and Æstivalis from the far South, especially of the low, warm wooded regions. Even Labrusca is not the most proper species for the inland hardships, though great blessings have followed the efforts of Bull, Rogers, Moore, Miller, Campbell and many others. From the exposed fields of the large-fruited Æstivalis and "steel-clad" Rupestris, and Riparia of the West and Southwest, where parching drought, balmy zephyrs, play summer one day, and rattling hail and sleet, and bare-faced, whistling "Northers" play winter the next, can the experimenter draw with immeasurable prospects of great success in this region. On the other hand, the South can feel encouraged most royally in her large, luscious Scuppernongs, Æstivalis, and the wonderfully prolific, long-clustered, tightly clinging exquisite Cinerea See what has resulted from accidental wild mixing of Cinerea and Æstivalis, in Georgia and elsewhere! Warren, Herbemont, Le Noir, Pauline, Louisiana, Harwood, and still brighter gems yet to hear from, have come to bless millions of homes with a sprightlier fruit than was ever known among the Vinifera developments of thousands of years.

The discovery of the truth that the Warren, Herbemont, etc., are the result of such a mixture, is of inconceivable value to the American vine-grower.

I humbly claim the honor of the solution and demonstration of this knotty question of the scientific viticulturist before you here to-day. I am happy to have the privilege, by the kind invitation of your President, to declare this discovery before the largest horticultural society in the world—The American Horticultural—under the span of the greatest horticultural hall, and within the grounds of the greatest exposition the world ever saw, and to demonstrate it, in part, by growing plants in pots, mounted leaves, seeds and wood, before you here. After years of diligent search, enquiry, collecting samples, and the growing of thousands of seedlings of Herbemont, aided by comparative anatomy, and having samples of other such hybrids, known as such, produced by Hermann Jaeger, and a number found wild by me, I feel satisfied I have demonstrated what Prof. Millardet has recently surmised by botanical analysis.

In connection with these investigations many other similar but less difficult problems have been solved. The Delaware proves to be a hybrid of Labrusca and Æstivalis, having no Vinifera blood, as generally supposed. Cynthiana proves to be only a synonym for Norton's Virginia, and not a native variety from Arkansas. Warren proves to be a distinct variety from Herbemont and not a synonym. The original vine stands in Warren county, Georgia, hale and healthy, over thirty-three inches in circumference at base. There are numerous seedlings of Warren in various parts of the South, varying slightly from it. Of these Herbemont appears to be one.

Now I feel we need no longer invite rot, mildew and phylloxera, by hybridizing with Vinifera, seeking fine quality when we have such examples of pure American blood with freedom from disease, as are Delaware, Ulster

Prolific, Warren and its numerous progeny, Elvira, and its bright young family, Jaeger's No. 70, and such pure bloods as Norton, Perkins, Lady, Amber Scuppernong, Jaeger's many Æstivalis and Rupestris and some remarkable Texan varieties. We have everything to encourage us, except we need more Caywoods, Marvins, Campbells, Rommels, Onderdonks and Jaegers.

There are no less than ten species of grapes in the United States possessing great capabilities in the hands of skillful experimenters. From one or two species of apple, naturally small, astringent, and unfit for food, have come vast developments, till now the entire year is supplied with the most appetizing and healthful of fruits; yet room still remains for further improvement. Then what latitude may we lend our fancies in the contemplation of this decemvirate of Vitis (life-giving) vines, which stretch forth their affectionate tendrils, as though they would bind up and beautify, with luscious purple, pink and white festoons, every home in our broad land! It is a rising family; it is a loving genus; a few of its members have been the staying companions of man through all historic ages, and here, at our very doors, climbing the trees in our pastures, are added half a score more still brighter gems, with unnumbered varieties of each, to engage our acutest intellect, and exercise our most cunning skill, ready for infinite molding as we will.*

*The first premium was awarded Mr. Munson's collection of "Native Grapes of the United States" in the World's Exposition, at New Orleans, a compliment most worthily bestowed.—SECRETARY.